

SCIENCE & EDUCATION Impact

Benefits from USDA/Land-Grant Partnership

Discovery—Past, Present, and Future

Hatch Act supports collaborative, responsive research; trains tomorrow's scientists.

Safe, plentiful food and fiber, life saving biomedical and nutritional breakthroughs, new job and business opportunities, cleaner air and water—these are just a few benefits made possible by the Hatch Act of 1887. Through this act, Congress created a system of experiment stations to address the nation's diverse agricultural and environmental needs and provided essential base financial support for land-grant institutions in every state. Hatch funds support faculty and graduate student positions and research programs, state-specific studies on locally driven issues, and multistate research projects that benefit whole regions and often the entire nation. More than 7,800 Hatch-supported, peer-reviewed projects are under way nationwide today. The following is a small sample of Hatch-related accomplishments and discoveries.

Payoff

- **In it for the long run.** For more than 100 years, Hatch funds have supported research on vital agricultural issues. That long, uninterrupted scientific investment provides a crucial perspective as we strive toward more sustainable farming systems. Two examples include **Missouri's** 113-year-old Sanborn Field and **Alabama's** 109-year-old Old Rotation, which are sites of critical soil experiments that are still used by scientists worldwide to solve modern-day problems.
- **Tapping water.** Irrigation is a necessity for profitable crop production in many parts of the nation, but this limited, often coveted resource must be used responsibly. Hatch funds helped researchers develop water-efficient irrigation systems such as subsurface irrigation systems that have 95 percent to 100 percent water use efficiency ratings, compared to 50 percent for furrow irrigation and 75 percent for standard sprinkler systems. Thanks to research conducted at **Kansas State**, 15,000 acres of corn and other row crops in Kansas are now subsurface-irrigated. **Colorado State** researchers found that using subsurface drip irrigation on corn, grain sorghum, and sunflowers reduced water use and sustained high, uniform crop yields. Another Hatch-supported irrigation study at **Mississippi State** helped Mississippi Delta cotton farmers, who irrigate 800,000 acres of cotton, increase their average profit by \$40 an acre.

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- **Winning a 30-year bug war.** Hatch funding helped **Florida** researchers win a 30-year battle with mole crickets, introduced pests that cause \$94 million in damage to Florida turf and pastures each year. When federal restrictions limited the use of DDT-type pesticides in the 1970s, finding new methods of mole cricket control became a priority for researchers. The scientists identified a nematode that kills mole crickets without harming other insects and have now patented its use. Integrated pest management projects (IPM) in many states also have reaped profits for producers. In **Vermont**, an apple IPM program helped 97 percent of the state's growers reduce their pesticide use. **Arizona's** cotton IPM work helped reduce pesticide spraying for various cotton pests by 58 percent and saved growers more than \$130 million in reduced pesticide costs.
- **Crossing state lines.** Hatch funds support multistate projects which allow researchers to broaden their disciplinary expertise and avoid unnecessary duplication of efforts. One such project in the north-central states helped fruit tree growers increase yields 20 percent and increase fruit size by 10 percent. State and federal government invested \$5 million in this project; the tree-fruit industries reaped 60 times that investment in measurable benefits—more than \$300 million. Another north-central project focused on developing more productive corn varieties, involved a \$3 billion state and federal investment from 1865 to 1996, and reaped measurable payoffs of \$260 billion during this period. Similar work with bovine respiratory disease, a disease that costs U.S. cattle producers \$3 billion in losses each year, resulted in a vaccine that decreased incidence of the disease threefold. The project also is helping manage bovine viral diarrhea virus, which costs U.S. cattle producers up to \$7 million annually. A western region study coordinated efforts among **California, Colorado State, Kansas State, Minnesota, Montana State, Nebraska, Oregon State, South Dakota State, Texas, Utah State, Washington State and Wyoming** to respond rapidly to outbreaks of five diseases that can devastate the region's grain crops.
- **Graduate discoveries.** One of the Hatch Act's greatest benefits is the funding it provides for the scientists of tomorrow. More than 6,000 graduate

students are involved in experiment station studies nationwide, assisting with today's research and preparing themselves to lead tomorrow's scientific discoveries. For example, in Hatch-funded graduate students in **Arkansas** are developing bioregenerative life-support systems that will allow astronauts to make long-term visits to Mars and the moon. **California** graduate students found that using locally grown fruits and vegetables in the state's farm-to-school salad bar programs encouraged students to eat healthier and benefited local small and mid-sized farms. Since 2001, produce purchases by Davis, Calif., schools more than tripled, from \$13,000 to more than \$42,000, with local farmers supplying 38 percent of the produce. **Ohio State** graduate and undergraduate students helped develop a soy-based bread called "Healthyhearth" that makes it easier for people to consume more soy protein, which is believed to reduce the risk of heart disease, fight cancer, and prevent bone loss and other chronic diseases.

- **Every state under the sun.** Sun Grant Centers are proposed for **South Dakota State, Oregon State, Oklahoma State, Tennessee, and Cornell**. With leadership from USDA-CSREES, these centers emphasize integrated Hatch-supported research, extension, and educational programs on renewable energy and biobased industries for rural communities. The centers will work with U.S. Department of Energy bioenergy centers in Tennessee and Colorado to build a biobased economy that benefits farmers, rural communities, and the public and enhances America's energy security.



**Cooperative State Research, Education,
and Extension Service**
United States Department of Agriculture

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